AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of establishing a path for distributing data through a network, comprising:

establishing a first data distribution path through the network, the network comprising at least one switch and one link;

determining whether eavesdropping has occurred on the first data distribution path using quantum cryptography; and

establishing a second data distribution path through the network based on the eavesdropping determination, wherein the second data distribution path comprises a different route through the network than the first data distribution path.

2. (Original) The method of claim 1, wherein the network comprises an optical network.

3. (Original) The method of claim 1, wherein the at least one switch comprises at least one optical switch.

4. (Original) The method of claim 1, wherein the at least one link comprises at least one optical link.

5. (Original) The method of claim 1, wherein the first data distribution path comprises a plurality of links and switches.

6. (Original) The method of claim 5, wherein the second data distribution path comprises a plurality of links and switches.

7. (Original) The method of claim 6, wherein the first data distribution path and the second data distribution path comprise no common links and switches.

8. (Original) The method of claim 6, wherein the first data distribution path and the second data distribution path comprise a subset of common links and switches.

9. (Original) The method of claim 1, wherein the first data distribution path comprises a first encryption key distribution path.

10. (Original) The method of claim 1, wherein the second data distribution path comprises a second encryption key distribution path.

11. (Original) The method of claim 9, further comprising:

distributing a first encryption key via the first encryption key distribution path.

12. (Original) The method of claim 10, further comprising:

distributing a second encryption key via the second encryption key distribution path.

13. (Currently amended) A computer-readable medium containing instructions for controlling at least one processor to perform a method of establishing a path for distributing data through a network, the method comprising:

initiating establishment of a first data distribution path through the network, the network comprising at least one switch and one link;

determining whether eavesdropping has occurred on the first data distribution path using quantum cryptography; and

initiating establishment of a second data distribution path through the network based on the eavesdropping determination, wherein the second data distribution path comprises a different route through the network than the first data distribution path.

14. (Currently amended) A system for establishing a path for distributing data through a network, comprising:

means for establishing a first data distribution path through the network, the network comprising at least one switch and one link;

means for determining whether eavesdropping has occurred on the first data distribution path using quantum cryptography; and

means for establishing a second data distribution path through the network based on the eavesdropping determination, wherein the second data distribution path comprises a different route through the network than the first data distribution path.

15. (Original) A system for establishing a path for distributing data through a network, comprising:

a switch configured to establish a first encryption key distribution path through the network, the first encryption key distribution path comprising a plurality of switches and links; and

a data distribution endpoint configured to determine whether eavesdropping has occurred on the first encryption key distribution path using quantum cryptography,

wherein the switch is further configured to establish a second encryption key distribution path through the network responsive to the eavesdropping determination, the second encryption key distribution path comprising a plurality of switches and links.

16. (Currently amended) A method of constructing a path through a multi-node communications network, comprising:

sending, from a data source node, a message requesting a path through the network, the request comprising identifiers of at least one of a link and a node in the network; [[and]]

setting up the path through the network, the path excluding the at least one of the link and the node in the network; and

sending data from the data source node via the path.

17. (Original) The method of claim 16, wherein setting up the path through the network comprises:

constructing a first graph of a topology of the network.

18. (Original) The method of claim 17, wherein setting up the path through the network further comprises:

constructing a second graph of a topology of the network by omitting the at least one of a link and node in the network from the first graph.

19. (Original) The method of claim 18, wherein setting up the path through the network further comprises:

determining a shortest path through the second graph.

20. (Original) The method of claim 16, wherein the multi-node communications network comprises optical switches.

21. (Original) The method of claim 20, wherein the optical switches are interconnected via links.

22. (Original) The method of claim 21, wherein the links comprise one or more optical fibers.

23. (Original) The method of claim 16, wherein the multi-node communications network comprises an optical network.

24. (Currently amended) A computer-readable medium containing instructions for controlling at least one processor to perform a method of constructing a path through a multi-node communications network, the method comprising:

receiving, from a data source node, a request to set-up a path through the network, the request comprising identifiers of at least one of a link and a node in the network; [[and]]

setting up the path through the network, the path excluding the at least one of the link and the node in the network; and

sending data received from the data source node via the path.

25. (Currently amended) A system for constructing a path through a multi-node communications network, comprising:

means for receiving, from a data source node, a request for ~~requesting~~ a path through the network, the request comprising identifiers of at least one of a link and a node in the network;

[[and]]

means for setting up the path through the network, the path excluding the at least one of the link and the node in the network; and

means for sending data received from the data source node via the path.

26. (Original) A system for constructing a path through a multi-node communications network, comprising:

a data distribution endpoint configured to request a path through the network, the request comprising identifiers of at least one of a link and a node in the network; and

an optical switch configured to set up the path through the network, the path excluding the at least one of the link and the node in the network.

27. (Withdrawn) A method of locating an eavesdropper in an optical network, comprising:

transmitting photons across a first path in the optical network, the first path comprising a plurality of links and nodes; and

identifying a location of an eavesdropper of the transmitted photons by successively omitting each link and node from the first path and determining an occurrence of eavesdropping at each omission using quantum cryptography.

28. (Withdrawn) The method of claim 27, further comprising:

notifying a management entity of the optical network of the location of the eavesdropper.

29. (Withdrawn) The method of claim 27, wherein the nodes comprise optical switches.

30. (Withdrawn) A computer-readable medium containing instructions for controlling at least one processor to perform a method locating an eavesdropper eavesdropping photons transmitted in an optical network, the method comprising:

transmitting photons across a first path in the optical network, the first path comprising a plurality of links and nodes; and

identifying a location of an eavesdropper of the transmitted photons by successively omitting each link and node from the first path and determining an occurrence of eavesdropping at each omission using quantum cryptography.

31. (Withdrawn) An optical system, comprising:

an optical switch configured to:

forward photons across a first path in the optical network, the first path comprising a plurality of links and nodes, and

successively omit each link and node from the first path; and

a distribution endpoint configured to:

identify a location of an eavesdropper of the forwarded photons by determining an occurrence of eavesdropping at each omission of each link and node from the first path using quantum cryptography.

32. (Withdrawn) A system for locating an eavesdropper eavesdropping photons transmitted in an optical network, comprising:

means for transmitting photons across a first path in the optical network, the first path comprising a plurality of links and nodes; and

means for identifying a location of an eavesdropper of the transmitted photons by successively omitting each link and node from the first path and determining an occurrence of eavesdropping at each omission using quantum cryptography.

33. (Currently amended) A method of routing around eavesdroppers in a network, comprising:

establishing a first path in the network;

transmitting data symbols over the first path;

identifying eavesdropping on the first path using quantum cryptography;

establishing a second path in the network responsive to the eavesdropping identification, wherein the second path comprises a different route through the network than the first path; and

transmitting data symbols over the second path.

34. (Original) The method of claim 33, wherein the network comprises an optical network.

35. (Original) The method of claim 33, wherein the at least one switch comprises at least one optical switch.

36. (Original) The method of claim 33, wherein the at least one link comprises at least one optical link.

37. (Original) The method of claim 33, wherein the first path comprises a plurality of links and switches.

38. (Original) The method of claim 37, wherein the second path comprises a plurality of links and switches.

39. (Original) The method of claim 38, wherein the first path and the second path comprise no common links and switches.

40. (Original) The method of claim 38, wherein the first path and the second path comprise a subset of common links and switches.

41. (Original) The method of claim 33, wherein the data symbols comprise at least a portion of an encryption key.

42. (Original) The method of claim 33, wherein the data symbols comprise polarized photons.

43. (Original) A quantum encryption key distribution device, comprising:

a transceiver; and

a processing unit configured to:

establish a first key distribution path in the network, the first key distribution path comprising a plurality of links and switches,

transmit at least a portion of a first encryption key over the first key distribution path via the transceiver,

identify eavesdropping on the first key distribution path using quantum cryptographic techniques,

establish a second key distribution path in the network responsive to the eavesdropping identification, the second key distribution path comprising a plurality of links and switches, and

transmit at least a portion of a second encryption key over the second key distribution path via the transceiver.

44. (Currently amended) A system for routing around eavesdroppers in a network, comprising:

means for establishing a first path in the network;

means for transmitting data symbols over the first path;

means for identifying eavesdropping on the first path using quantum cryptography;

means for establishing a second path in the network responsive to the eavesdropping identification, wherein the second path comprises a different route through the network than the first path; and

means for transmitting data symbols over the second path.

45. (Withdrawn) A method of establishing a path for distributing encryption key material through an optical network, the optical network comprising links interconnecting optical switches, the method comprising:

establishing a first key distribution path through a first series of links and optical switches of the optical network.

46. (Withdrawn) The method of claim 45, wherein the first series of links and optical switches comprises a plurality of links and a plurality of optical switches.

47. (Withdrawn) The method of claim 45, further comprising:

distributing encryption key material via the first key distribution path.

48. (Withdrawn) The method of claim 45, further comprising:

determining whether eavesdropping has occurred on the first key distribution path using quantum cryptography.

49. (Withdrawn) The method of claim 48, further comprising:

establishing a second key distribution path through a second series of links and optical switches of the optical network.

50. (Withdrawn) The method of claim 49, wherein the first series of links and optical switches and the second series of links and optical switches comprise no common links and optical switches.

51. (Withdrawn) The method of claim 49, wherein the first series of links and optical switches and the second series of links and optical switches comprise a subset of common links and optical switches.

52. (Withdrawn) A computer-readable medium containing instructions for controlling at least one processor to perform a method for establishing a path for distributing encryption key material through an optical network, the optical network comprising links interconnecting optical switches, the method comprising:

establishing a key distribution path through a series of links and optical switches of the optical network.

53. (Withdrawn) An optical network, comprising:

a plurality of optical switches interconnected by links; and

means for establishing a key distribution path through a series of optical switches comprising a subset of the plurality of optical switches.